

ECOSYSTEM SERVICES AND THE PUBLIC TRUST DOCTRINE: WORKING CHANGE FROM WITHIN

J.B. RUHL^{*}
JAMES SALZMAN^{**}

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I. INTRODUCTION

What to do with the public trust doctrine? Environmental law scholars have been asking that question for nearly forty years, since Professor Joseph Sax predicted in his famous law journal article that “of all the concepts known to American law, only the public trust doctrine seems to have the breadth and substantive content which might make it useful as a tool of general application for citizens seeking to develop a comprehensive legal

^{*} Matthews & Hawkins Professor of Property, The Florida State University College of Law, Tallahassee, Florida.

^{**} Professor, Duke University School of Law and Nicholas School of the Environment. We are thankful for the comments received from participants at The University of South Carolina School of Law’s September 2006 symposium on “Bridging the Divide: Public and Private Interest in Coastal Marshes and Marsh Islands.” Ali Stevens, FSU Class of 2007, provided valuable research assistance, and the Florida State University College of Law and Duke Law School sustained our respective research efforts through financial and other support. All errors and other deficiencies in this final work product are nonetheless solely our responsibility, thus please direct all comments or questions to jruhl@law.fsu.edu or salzman@law.duke.edu.

approach to resource management problems.”¹ This Article briefly surveys reasons why Sax’s vision is not yet fulfilled, and proposes that the public trust doctrine can be used to achieve most of Sax’s vision by working from within the doctrine, not by changing it. Part I of the article surveys the historical underpinnings of the doctrine. Part II analyzes how natural capital and ecosystem services can be integrated into the public trust doctrine. Traditional public trust resources often contain natural capital supplying economically valuable ecosystem services to the public, and the public’s enjoyment of those values is appropriately treated as a use of the trust lands within the meaning of the public trust doctrine. In a quite straightforward manner, therefore, the restrictions applicable under the public trust doctrine attach to the natural capital found on trust lands. Hence, rather than reshaping the public trust doctrine to fit ecological goals, Sax’s vision can be advanced by reshaping the way ecological goals are framed to fit the public trust doctrine.

II. THE PUBLIC TRUST DOCTRINE THROUGH THE AGES – ONCE UTILITARIAN, ALWAYS UTILITARIAN?

The public trust doctrine traces its roots to the Institutes of Justinian in Roman Law, which declared that there are three things common to all people: (1) air; (2) running water; and (3) the sea and its shores.² Along with the Romans, this principle invaded England and became part of its common law, which the United States imported with minor variations after the American Revolution. Precisely how and in what form the doctrine traveled through time and space is the subject of considerable debate.³ The conventional account is that while the British version stated that tidelands were held by the King for the benefit of all English subjects, the American version replaced the crown with the states, and the state courts became the chief enforcer of what has remained a common law doctrine of property.⁴ From these beginnings, Sax summarized the core principles of the doctrine as it had evolved in American law by 1970 as imposing three restrictions on government action: “first, the property subject to the trust must not only be used for a public

¹ Joseph L. Sax, *The Public Trust Doctrine In Natural Resource Law: Effective Judicial Intervention*, 68 MICH. L. REV. 471, 474 (1970).

² See JOHN COPELAND NAGLE & J.B. RUHL, *THE LAW OF BIODIVERSITY AND ECOSYSTEM MANAGEMENT* 781 (2d ed. 2006). See generally Sax, *supra* note 1, at 475-555 (providing one of the most complete histories of the public trust doctrine as it stood in 1970).

³ See James R. Rasband, *The Public Trust Doctrine: a Tragedy of the Common Law*, 77 TEX. L. REV. 1335, 1339-45 (1999) (reviewing BONNIE J. MCCAY, *OYSTER WARS AND THE PUBLIC TRUST: PROPERTY, LAW, AND ECOLOGY IN NEW JERSEY HISTORY* (1998)).

⁴ See Sax, *supra* note 1, at 475-77.

purpose, but it must be held available for use by the general public; second, the property may not be sold, even for a fair cash equivalent; and third, the property must be maintained for particular types of uses.”⁵

The public trust doctrine’s imposed scope of trust can be thought of in several dimensions.⁶ First, it has a geographic reach that must be defined. In the American version, this has traditionally meant all lands subject to the ebb and flow of the tide, and all waters navigable in fact, such as rivers, lakes, ponds, and streams, though, as discussed below, the scope has been expanded in some states. Next, the uses that the trust protects and prohibits must be defined. In American jurisprudence, fishing, commerce, and navigation have long been the core protected uses, along with other uses such as boating, swimming, anchoring, and, in some states, general recreation. Because uses inconsistent with these protected values may be prohibited, states wishing to facilitate incompatible uses may be restrained from doing so. Finally, the public trust doctrine places restrictions on the alienation of public trust lands to private interests when doing so would undermine the protected public uses.

Of these three attributes, the restriction on alienation of trust resources gained significant force through the Supreme Court’s decision in *Illinois Central Railroad v. Illinois*.⁷ The court held the public trust doctrine prevented Illinois from conveying portions of the bed of Lake Michigan adjoining Chicago to private interests.⁸ Yet the underlying rationale for retaining sovereign ownership of public trust lands clearly was to promote public uses. As Professor Richard Lazarus summarized, “the traditional trust

⁵ *Id.* at 477. The federal courts have virtually never applied any form of public trust duties to federal government use and regulation of public lands and resources. See Eric Pearson, *The Public Trust Doctrine in Federal Law*, 24 J. LAND RESOURCES & ENVTL. LAW 173 (2004). As Pearson points out, the seminal case describing the federal government’s public trust duties, *Light v. United States*, 220 U.S. 523 (1911), ruled that “it is not for the courts to say how that trust shall be administered. That is for Congress to determine. The courts cannot compel it to set aside lands for settlement, or to suffer them to be used for agricultural or grazing purposes, nor interfere when, in the exercise of its discretion, Congress establishes a forest reserve for what it decides to be national and public purposes.” *Id.* at 537. As Pearson observes, “the public trust doctrine in state law empowers the judicial branch to overturn substantive choices made by political branches of government. The public trust doctrine in federal law works to the opposite end. In federal law, the doctrine empowers the political branches of government to implement substantive choices despite objections in the judicial branch. Night, meet day.” Pearson, *supra* at 176-77.

⁶ The short summary provided in this paragraph is based on NAGLE & RUHL, *supra* note 2.

⁷ Ill. Cent. R.R. v. Illinois, 146 U.S. 387 (1892).

⁸ See generally Joseph D. Kearney & Thomas W. Merrill, *The Origins of the American Public Trust Doctrine: What Really Happened in Illinois Central*, 71 U. CHI. L. REV. 799 (2004) (providing a probing history of the case identified as the foundation of the public trust doctrine in the United States).

doctrine in the United States became as much a legal basis for economic expansion as for resource protection.”⁹ Referencing a long list of cases, Lazarus explains that the tests for what uses the state may not endorse “have proved susceptible to flexible application. Courts have found diverse activities such as production of oil and construction of bridges, a YMCA, restaurants, bars, and a shopping complex”¹⁰ as well as airport runways, highways, and driving ranges, to have “passed public trust muster.”¹¹ Public uses of this nature are not usually associated with protection of natural systems, and even the core trust uses, such as fishing and navigation, can present significant risks to ecological resources.¹²

Therefore, it is not surprising that prior to Sax’s article there is little evidence that anyone viewed the public trust doctrine, either in theory or in application, as an engine of resource management law.¹³ Indeed, Sax did not propose how to make the public trust doctrine a comprehensive legal approach to resource management problems; the article was more an invitation to courts to do so than it was a blueprint of the final doctrinal form. Sax described his article, the vast bulk of which was a historical account of the doctrine’s development through 1970,¹⁴ as having “attended essentially to problems of process rather than to problems of substance.”¹⁵ The latter, however, was his main concern. Sax explained his proposed use of the public trust doctrine requires an unprecedented substantive expansion of trust doctrine reach beyond its traditional utilitarian commercial and recreational protected uses.¹⁶ Sax recognized that “the historical scope of public trust law is quite narrow,”¹⁷ but argued:

[T]he judicial techniques developed in public trust cases need not be limited either to these few conventional interests or to questions of disposition of public properties [I]t seems that the delicate

⁹ Richard J. Lazarus, *Changing Conceptions of Property and Sovereignty in Natural Resources: Questioning the Public Trust Doctrine*, 71 IOWA L. REV. 631, 641 (1986) (citing Molly Selvin, *The Public Trust Doctrine in American Law and Economic Policy, 1789-1920*, 1980 WIS. L. REV. 1403, 1422-37).

¹⁰ *Id.* at 651-52 (citations omitted).

¹¹ *Id.* at 652.

¹² See, e.g., Jeffrey W. Henquinet and Tracy Dobson, *The Public Trust Doctrine and Sustainable Ecosystems: A Great Lakes Fisheries Case Study*, 14 N.Y.U. ENVTL. L.J. 322, 335-38 (2006) (discussing adverse impacts of fishing).

¹³ A search conducted in Westlaw’s JLR database for “‘public trust doctrine’ /p ‘natural resources’ environment! & da(bef 1970)” yielded zero documents.

¹⁴ See generally Sax, *supra* note 1, at 475-555.

¹⁵ *Id.* at 558.

¹⁶ *Id.* at 556-57.

¹⁷ *Id.* at 556.

mixture of procedural and substantive protections which the courts have applied in conventional public trust cases would be equally applicable and equally appropriate in controversies involving air pollution, the dissemination of pesticides, the location of rights of way for utilities, and strip mining or wetland filling on private lands in a state where government permits are required.¹⁸

Many academics joined Sax's project, so much so that "[d]uring the last thirty years, few issues in natural resources law have received more scholarly attention than the public trust doctrine."¹⁹ Consistent with Sax's vision, and fueled by dissatisfaction over the states' lethargic legislative responses, the doctrine soon became academics' "legal Holy Grail: an extra-constitutional, countermajoritarian check on the natural resource allocation decisions of misguided legislative majorities."²⁰

However, not all academics agreed with Sax. In the mid 1980s, for example, Richard J. Lazarus expressed deep skepticism about whether the public trust doctrine could ever supply a comprehensive legal approach to resource management problems.²¹ Among his numerous criticisms of the doctrine, Lazarus emphasized its utilitarian origins and substance as critical liabilities to any project attempting to use it to advance the law of

¹⁸ *Id.* at 556-57.

¹⁹ Rasband, *supra* note 3, at 1335. A search for "sax /s 'effective judicial intervention'" in Westlaw's JLR database turned up 420 documents. The article clearly has sparked broad academic discussion of the public trust doctrine in environmental contexts. For example, by contrast to the "before 1970" search, *see supra* note 14, a search conducted in Westlaw's JLR database for "'public trust doctrine' /p 'natural resources' environment! & da(aft 1970)" yielded 953 documents.

²⁰ Rasband, *supra* note 3, at 1335-36.

²¹ *See* Lazarus, *supra* note 9; *see also* William D. Araiza, *Democracy, Distrust, and the Public Trust: Process-Based Constitutional Theory, the Public Trust Doctrine, and the Search for a Substantive Environmental Value*, 45 UCLA L. Rev. 385 (1997) (writing that natural resources management requires technical expertise outside the scope of the doctrine); Richard Delgado, *Our Better Natures: A Revisionist View of Joseph Sax's Public Trust Theory of Environmental Protections, and Some Dark Thoughts on the Possibility of Law Reform*, 44 VAND. L. REV. 1209 (1991) (arguing that the public trust approach is inherently antagonistic to the promotion of innovative environmental thought); James L. Huffman, *A Fish Out of Water: The Public Trust Doctrine in a Constitutional Democracy*, 19 ENVTL. L. 527 (1989) (arguing that an expanded trust violates its property origins); Rasband, *supra* note 3 (arguing that the doctrine usurps legislative authority and poses the potential for unconstitutional takings of property); George P. Smith II and Michael W. Sweeney, *The Public Trust Doctrine and Natural Law: Emanations Within a Penumbra*, 33 B.C. ENVTL. AFF. L. REV. 307 (2006) (using natural law theory to argue that expansion of the trust inappropriately interferes with private property rights).

environmental protection.²² By the time Lazarus' article was published, history supported him; the burgeoning statutory initiative for environmental protection proved that regulatory law would outpace the public trust doctrine (and common law in general) as the primary source of law for environmental protection.²³ In short, Lazarus argued that because of its utilitarian purposes, the public trust doctrine was not well suited to strengthening environmental protection law. Further, Lazarus argued that the development of vast statutory regimes for environmental protection meant the doctrine was not needed. Lazarus even declared that the "doctrine simply has no place in this emerging scheme."²⁴

With some notable exceptions, state courts appear to have acted as Lazarus predicted, not as Sax hoped.²⁵ Few cases have actually forced states to alter their resource management plans. One famous example in which a state did change its resource management plan occurred in California and involved the diversion of water from Mono Lake. The court ruled "[t]he state has an affirmative duty to take the public trust into account in the planning and allocation of water resources, and to protect public trust uses whenever feasible."²⁶ Nevertheless, this and other similar cases are mindful of the "publicness" of public trust lands; they emphasize utilitarian uses such as navigation, fishing, and recreation and do not highlight ecological preservation or active conservation. Even in the *Mono Lake* case, for example, the court held that in exercising the public trust "the state must bear in mind its duty as trustee to consider the effect of the taking [of water] on the public trust, and to preserve, so far as consistent with the public interest, the *uses* protected by the trust."²⁷

Therefore, the chief impact of the public trust doctrine is facilitating public access to and use of tidelands and beaches. The doctrine has not been transformed into a broadly applied judicial ecosystem protection program in any state. It is true that an occasional state case suggests an ecologically-oriented purpose of the doctrine. Perhaps the most noted case in this regard is from Wisconsin, in which the court found that the doctrine

²² See Lazarus, *supra* note 9, at 710-11.

²³ See *id.* at 665-91.

²⁴ *Id.* at 701.

²⁵ By contrast to its wide endorsement in academia, see Rasband, *supra* note 3, (based on searches in Westlaw's ALLFEDS and ALLSTATES databases for "sax /s 'effective judicial intervention'") Sax's article has been cited by federal courts six times and by state courts thirty-four times. The judicial ambivalence toward Sax's vision of the public trust doctrine is summarized in NAGLE & RUHL, *supra* note 2, at 780-86.

²⁶ Nat'l Audubon Soc'y v. Superior Court, 658 P.2d 709, 728 (Cal. 1983).

²⁷ *Id.* (citation omitted).

requires wetland areas be limited to uses consistent with “natural conditions.”²⁸ Several recent cases serve as variations on the theme.²⁹ By and large, however, the state courts have declined to mobilize Professor Sax’s vision of the public trust doctrine as a means of effective and broad judicial intervention in resource management policy.³⁰

The disparity between the public trust doctrine’s judicial and academic treatments has led one commentator to conclude that the doctrine “remains a formidable theme of natural resources law, if perhaps more rhetorically than legally charged.”³¹ Lazarus less discretely summarized the status of the doctrine in the midst of the statutory revolution in environmental law:

The strength of the public trust doctrine necessarily lies in its origins; navigable waters and submerged lands are the focus of the doctrine, and the basic trust interests in navigation, commerce, and fishing are the object of its guarantee of public access. Commentators and judges alike have made efforts to ‘liberate,’ ‘expand,’ and ‘modify’ the doctrine’s scope, yet its basic focus remains relatively unchanged. Courts still repeatedly return to the doctrine’s historical function to determine its present role. When the doctrine is expanded, more often than not the expansions require tortured constructions of the present rather than repudiations of the doctrine’s past.³²

²⁸ See *Just v. Marinette County*, 201 N.W.2d 761 (Wis. 1972).

²⁹ See, e.g., *Selkirk-Priest Basin Ass’n v. State*, 899 P.2d 949 (Idaho 1995) (doctrine allows environmental group standing to challenge timber sales on ground that sedimentation could injure fish spawning grounds); *Vander Bloemen v. State Dep’t of Natural Res.*, 551 N.W.2d 869 (Wis. Ct. App. 1996) (doctrine extends to protection of lakeside ecology). For a thorough update of these and other state law cases on the application of the public trust doctrine in ecosystem management contexts, see Arnold L. Lum, *How Goes the Public Trust Doctrine: Is the Common Law Shaping Environmental Policy?*, 18 NAT. RESOURCES & ENV’T at 73 (Fall 2003). Lum covers state cases extending the trust duties to public natural resources other than navigable waters, such as groundwater and parks, and extending the trust uses to recreational and ecological uses. On the other hand, he notes that not all state cases result in expansion of the doctrine’s scope or protected resources. See, e.g., *Rettkowski v. Dep’t of Ecology*, 858 P.2d 232 (Wash. 1993) (does not apply to groundwater), and that few state courts have endorsed breach of trust claims against state agencies. See Lum, *supra*, at 74. Lum concludes that the force of the public trust doctrine in ecosystem protection contexts is “growing,” though by how much and how fast he does not estimate. *Id.*

³⁰ See, e.g., Henquinet and Dobson, *supra* note 12, at 347-65 (surveying the fisheries protection strength of the public trust doctrines of the Great Lakes states).

³¹ Erin Ryan, Comment, *Public Trust and Distrust: The Theoretical Implications of the Public Trust Doctrine for Natural Resource Management*, 31 ENVTL. L. 477, 490 (2001).

³² Lazarus, *supra* note 9, at 710-11.

III. INTEGRATING NATURAL CAPITAL AND ECOSYSTEM SERVICES INTO THE PUBLIC TRUST DOCTRINE

Unlike the outpouring of academic proposals to liberate, expand, and modify the public trust doctrine,³³ this Article accepts that the doctrine will, in most states and in most circumstances, remain bound to its utilitarian origins. The doctrine started out with a utilitarian purpose, has retained it, and because of the narrow doctrinal framework that keeps this purpose as its focus, will likely preserve the utilitarian purpose in the future. Rather than proposing the doctrine's expansion outside of its traditional boundaries, this Article proposes using the doctrine's core utilitarian purposes as a medium for protecting ecological resources. In other words, courts need not expand the public trust doctrine to fulfill Sax's goal of ecological protection; instead, they can approach the goal by reframing the ways in which ecological resources are computed in the doctrine's utilitarian calculus. Protecting ecosystems, in other words, is compatible with the doctrine even in its sharpest utilitarian projection.

The thesis of this Article is little more than a leveraging of the convergence represented by the discipline of ecological economics. Ecological economics, which emerged in the 1980s and gained full steam in the 1990s, focuses on recognizing the economic value natural systems provide.³⁴ Ecosystems have long been regarded as a source of valuable commodities and recreational pursuits that, obviously, do not always align with the goal of maintaining ecological integrity.³⁵ A major thrust of ecological economics, however, is to illuminate the role of ecosystems in providing economically valuable services to people. Ecosystem services include flood mitigation and groundwater recharge from wetlands, water

³³ Possibly the most extreme example is a proposal to extend the public trust doctrine to the electromagnetic spectrum. See Patrick S. Ryan, *Application of the Public-Trust Doctrine and Principles of Natural Resource Management to Electromagnetic Spectrum*, 10 MICH. TELECOMM. & TECH. L. REV. 285 (2004), available at <http://www.mttlr.org/volten/Ryan.pdf> (last visited Jan. 2, 2007). Most expansion proposals, by contrast, are incremental and focused on water resources. See, e.g., Kristen M. Fletcher, *Regional Ocean Governance: The Role of the Public Trust Doctrine*, 16 DUKE ENVTL. L. & POL'Y F. 187 (2006) (proposing application of the doctrine on regional ocean scales).

³⁴ The discipline of ecological economics was well underway by the 1990s, with the journal by that name starting in 1989 and a full-length book on the topic breaking the path for more to follow. See ROBERT COSTANZA, ED., *ECOLOGICAL ECONOMICS: THE SCIENCE AND MANAGEMENT OF SUSTAINABILITY* (Columbia Univ. Press 1991). And with their publication of *Ecological Economics*, Herman Daly and Joshua Farley have firmly planted the discipline on the university curriculum landscape. See JOSHUA FARLEY & HERMAN E. DALY, *ECOLOGICAL ECONOMIES: PRINCIPLES AND APPLICATIONS* (Island Press 2003).

³⁵ See NAGLE & RUHL, *supra* note 2, at 1003-35.

filtration and sediment capture from forests, nutrient cycling, gas regulation, pollination, thermal regulation, carbon sequestration, etc.³⁶ To further the economic paradigm, ecological economists speak of ecosystem services as flowing from the natural capital found in ecosystems such as forests, wetlands, coastal dunes, estuaries, and other ecologically defined units of study.³⁷ Although monetizing the value of natural capital and ecosystem services is more complex than estimating the economic value of a timber plantation or a hunting reserve,³⁸ natural capital and ecosystem services unquestionably are economically valuable.

³⁶ The concept of ecosystem services is not new, but it is sufficiently recent that it is yet to be fully developed into coherent policy terms, and surely not yet developed into applicable, hard law to be applied. Mooney and Ehrlich trace references to “services” in connection with ecosystems as far back as 1970. See HAROLD A. MOONEY & PAUL R. EHRLICH, *in* ECOSYSTEM SERVICES: A FRAGMENTARY HISTORY, *in* NATURE’S SERVICES: SOCIETAL DEPENDENCE ON NATURAL ECOSYSTEMS 11-19 (Gretchen C. Daily ed., Island Press 1997) [hereinafter *NATURE’S SERVICES*]. Walter Westman was the first to attempt to assign numbers to the values of what he called “nature’s services,” relying on the postulated technology costs of replacing or repairing impaired ecosystem functions. See Walter E. Westman, *How Much Are Nature’s Services Worth?*, SC., Sept. 2, 1977, at 960. Soon thereafter, in a little-noticed article, Edward Farnsworth *et al.* outlined one of the earliest comprehensive frameworks for considering the value of services provided by natural ecosystems. See Edward G. Farnsworth *et al.*, *The Value of Natural Ecosystems: An Economic and Ecological Framework*, 8 ENVIRONMENTAL CONSERVATION 275 (Winter 1981). Edward O. Wilson later gave ecosystem services prominent mention in his epic study of biodiversity, *The Diversity of Life*, published in 1992. See EDWARD O. WILSON, *THE DIVERSITY OF LIFE*, 305-10, 396 (Harvard Univ. Press 1992). Then a research team led by Robert Costanza grabbed national media headlines in 1997 with their estimate that global ecosystem service values were over \$30 trillion dollars. See Robert Costanza *et al.*, *The Value of the World’s Ecosystem Services and Natural Capital*, NATURE, May 15, 1997, at 253. Later that year, the highly-influential book *Nature’s Services* established the ecological basis for ecosystem service theory in many different ecosystem settings. See *NATURE’S SERVICES*, *supra*. Most recently, the United Nations’ Millennium Ecosystem Assessment published a global survey of the production and delivery of ecosystem services. See MILLENNIUM ECOSYSTEM ASSESSMENT, *ECOSYSTEMS AND HUMAN WELL-BEING: SYNTHESIS* (Island Press 2005). For a more detailed history, including coverage of the emergence of the ecosystem services concept in legal literature, see James Salzman, *A Field of Green? The Past and Future of Ecosystem Services*, 21 J. LAND USE AND ENVTL. L. 133 (2006).

³⁷ Land has always been treated in classical and neoclassical economics as one of the essential factors of production. In ecological economics, the concept of natural capital provides a major extension beyond ‘land,’ in terms of recognizing the importance of natural resources to the production of economically valuable goods and services. See Paul Elkins, Carl Folke & Rudolf De Groot, Editorial, *Identifying Critical Natural Capital*, 44 ECOLOGICAL ECONOMICS 159, 160 (2003).

³⁸ Of course, this has proven to be the most significant obstacle to recognizing ecosystem services in environmental decision-making. See James Salzman, *Valuing Ecosystem Services*, 24 ECOLOGY L.Q. 887 (1997).

This Article proposes using the concepts of natural capital and ecosystem services to change the ecological scope of the public trust doctrine from within, without having to contest the conventional utilitarian features of the narrow doctrinal framework. The argument is straightforward: traditional public trust resources often contain natural capital supplying economically valuable ecosystem services to the public; the public's enjoyment of those values is appropriately treated as a use of the trust lands within the meaning of the public trust doctrine; and, therefore, the restrictions applicable under the public trust doctrine attach to the natural capital found on trust lands. In short, we propose integrating natural capital and ecosystem services within the public trust doctrine's utilitarian core to make it more ecological on its surface.³⁹

A. Trust Resources as Natural Capital

As a threshold matter, it should be emphasized that nothing in this proposal is designed to justify expanding the geographic scope of the public trust doctrine beyond the traditional trust resources. Most states confine the doctrine to navigable and tidally-influenced waters, but some have extended the scope⁴⁰ into related resources such as non-navigable tributaries,⁴¹ dry sand beaches,⁴² and public parklands.⁴³ No state has gone nearly as far as Sax proposed, and this Article is not offering a theory on how states could or why states should expand the geographic scope of the doctrine. To be sure, resources outside the scope of the public trust doctrine contain natural capital from which valuable ecosystem services flow, but they also contain opportunities for commercial and recreational uses. Neither condition has prompted the courts to engage in wholesale expansion of the trust.

Taking the geographic scope of the trust as it stands in each state, trust resources often contain natural capital supplying ecosystem services to areas both within and beyond the geographic boundaries of the trust's reach. Navigable and tidally-influenced coastal and freshwater resources are the quintessential example of natural capital. Besides the water resource itself,

³⁹ A companion manuscript makes a similar case for transformation of nuisance doctrine. See J.B. Ruhl, *Making Nuisance Ecological* (Fla. State Univ. College of Law, Public Law Research Paper No. 216, 2006) available at <http://ssrn.com/abstract=931248> (last visited Jan. 2, 2007).

⁴⁰ See *Phillips Petroleum Co. v. Mississippi*, 484 U.S. 469, 475 (1988) ("it has been long established that the individual States have the authority to define the limits of the lands held in public trust . . .") (quoting *Shively v. Bowlby*, 152 U.S. 1, 26 (1894)).

⁴¹ See *Nat'l Audubon Soc'y v. Superior Court*, 658 P.2d 709 (Cal. 1983).

⁴² See *Matthews v. Bay Head Improvement Ass'n*, 471 A.2d 355 (N.J. 1984).

⁴³ See *Friends of Van Cortlandt Park v. City of New York*, 750 N.E.2d 1050 (N.Y. 2001).

areas receiving protection under the public trust doctrine can contain coastal marshes, seagrass beds, coastal sand and reef barriers, freshwater wetlands, fish habitat, and other aquatic resources capable of delivering service values, not merely commodity and recreational values, to human populations.⁴⁴ The valuable services this natural capital supplies include storm surge and flood mitigation, transformation, detoxification, and sequestration of pollutants, carbon, and nutrients, as well as one long recognized under the public trust doctrine—navigation.⁴⁵

B. Public Uses of Ecosystem Services from Trust Lands

The purpose of identifying trust resources as including natural capital, rather than to simply identify them as ecologically functional resources, is to draw the link to the economic importance of their ecosystem services. Ecosystem service values fit neatly into the utilitarian scope (e.g., navigation, hunting, fishing, swimming, boating, etc.) of the doctrine's protected uses.

The "trust = use" aspect of the public trust doctrine is the source of much concern in environmental protection law. For example, Lazarus warned:

Achievement of modern environmental protection and resource conservation goals, moreover, ultimately depends not so much on an 'expansion' of public trust values as it may require a repudiation of the doctrine's focus and traditional values [T]he promotion of commerce, a traditional public trust doctrine objective, is hardly a focus of resource protection values. Indeed, more often than not it serves as a counterweight to those values in the formulation of public policy because of its prodevelopment bias. Finally, public access, undoubtedly the single most important public trust guarantee, is often at odds with modern environmental conservation and protection laws. Increasingly, those laws must restrict access to protect resources.⁴⁶

⁴⁴ For a survey of these resources in the United States, see NAT'L BIOLOGICAL SERV., U.S. DEP'T OF THE INTERIOR, OUR LIVING RESOURCES: A REPORT TO THE NATION ON THE DISTRIBUTION, ABUNDANCE, AND HEALTH OF U.S. PLANTS, ANIMALS, AND ECOSYSTEMS, 233-92 (Edward T. LaRoe ed., 1995).

⁴⁵ See Charles H. Peterson & Jan Lubchenco, *Marine Ecosystem Services*, in *NATURE'S SERVICES*, *supra* note 36, at 177; Sandra Postel and Stephen Carpenter, *Freshwater Ecosystem Services*, in *NATURE'S SERVICES*, *supra* note 36, at 195.

⁴⁶ Lazarus, *supra* note 9, at 711.

Similarly, Richard Delgado's "first reservation with the public trust approach is that the model is inherently antagonistic to the promotion of innovative environmental thought. A trust is, by its nature, conservative – its purpose is to protect a corpus and put it to some use."⁴⁷ Under this conception of the doctrine, Sax's vision could lead to only one of two possible demises: either it would have required the doctrine to abandon its "trust = use" premises, in which case it would no longer be the public trust doctrine, or it would have carried the "trust = use" premise to the expanded set of resources, in which case it would not have fulfilled Sax's vision.

What ecological economics has shown us, however, is that when the value of natural capital and ecosystem services are taken into account, promoting economic benefits is consistent with protection of natural systems. The natural capital found in trust resources is used by the public for economic benefit as much as it uses the fishing grounds and the navigation channels for economic benefit. The economic value of the ecosystem services flowing from such natural capital is significant and vitally important to maintaining economic systems.⁴⁸ Although the economic benefits from natural capital are usually enjoyed outside the physical boundaries of trust resources, that is irrelevant so long as the natural capital is located within those boundaries. After all, protected trust uses such as navigation produce commercial benefits often distributed well beyond the physical boundaries of the trust resources over which such uses occur. Hence, rather than feeling repulsed by the "trust = use" feature of the traditional public trust doctrine, ecological economics teaches us to employ the feature to its fullest.

⁴⁷ Delgado, *supra* note 21, at 1214.

⁴⁸ For example, the historical losses of coastal and freshwater marshes in the Mississippi Delta region, and the economic consequences thereof in terms of reduced protection from storm surges, are covered comprehensively in a series of articles in a recent publication from the *National Wetlands Newsletter*. See AFTER THE STORM: RESTORING AMERICA'S GULF COAST WETLANDS, A SPECIAL REPORT OF THE NATIONAL WETLANDS NEWSLETTER, (Gwen Arnold ed., Env'tl. L. Inst.) (2006) [hereinafter *AFTER THE STORM*]. Coastal "wetland grasses, sedges, and trees reduce the effective water depth and can cause storm waves to touch bottom, or 'break,' further offshore, dissipating their energy many miles from sensitive built structures. Wetland soils also absorb wave energy, reduce the depth of flooding, bind soil, and reduce erosion Inland wetlands reduce flooding by storing and conveying floodwaters Experts estimate that a 1-acre wetland can hold up to 1.5 million gallons of water." Jon Kusler, *Wetlands, Hurricanes, and Flood Hazards*, in *AFTER THE STORM*, *supra*, at 34-35.

C. Evolving the Public Trust Doctrine from Within

With the issue framed in this manner, emerging knowledge of natural capital and ecosystem services values should integrate easily into the public trust doctrine. In all of its dimensions, “[c]ourts have held that consideration of trust concerns occurs in advance of proposed governmental action, requires prior comprehensive resource planning or specific cost/benefit balancing, and *includes a continuing duty to reconsider when circumstances and knowledge change*.”⁴⁹ The United States Supreme Court affirmed this point in *Lucas v. South Carolina Coastal Council*,⁵⁰ in which Justice Scalia’s majority opinion observed that the background principles of common law property and nuisance can evolve. Most notably, the opinion established the proposition that, “[w]hen, however, a regulation that declares ‘off-limits’ all economically productive or beneficial uses of land goes beyond what the relevant background principles would dictate, compensation must be paid to sustain it.”⁵¹ Yet Justice Scalia pointed out that “changed circumstances or new knowledge may make what was previously permissible [under common law] no longer so.”⁵²

In an effort to turn Justice Scalia’s caveat into the exception that swallows the rule, many legal scholars have redefined the role of common law property rights not to serve as a constraint on environmental statutes, but rather as a statutory liberator. For example, in *Lucas’s Unlikely Legacy: The Rise of Background Principles and Categorical Takings Defenses*, Professor Michael Blumm and co-author Lucas Ritchie offer a comprehensive survey of common law doctrines that could, some in their existing forms and others only through evolutionary judicial development, impose restrictions on a landowner’s ability to destroy natural capital, and thus insulate public regulation that duplicates such effects from attack as a regulatory taking of property.⁵³ As to the public trust doctrine, the authors observe that “many post-*Lucas* courts have jumped on that legal

⁴⁹ Lazarus, *supra* note 9, at 652 (emphasis added).

⁵⁰ 505 U.S. 1003 (1992).

⁵¹ *Id.* at 1030.

⁵² *Id.* at 1031.

⁵³ See Michael C. Blumm & Lucas Ritchie, *Lucas’s Unlikely Legacy: The Rise of Background Principles as Categorical Takings Defenses*, 29 HARV. ENVTL. L. REV. 321 (2005). In related work one of us has explored in general how Blumm and Ritchie’s thesis can be extended to integration of natural capital and ecosystem service values throughout the common law of property and nuisance. See J.B. Ruhl, *The Background Principles of Ecosystem Services—Did Lucas Open Pandora’s Box?*, 21 J. LAND USE & ENVTL. L. (forthcoming).

bandwagon, employing the public trust doctrine to defeat takings claims dealing with coastal areas and other submerged lands.”⁵⁴

However, Blumm and Ritchie want to drive the bandwagon down the very “expand the trust” road that that Lazarus warned against and in which the courts have not expressed much interest. They explain:

Some commentators have argued that an expanded, non-tidal application of the public trust as a defense to takings claims is inconsistent and irreconcilable with *Lucas* because it exceeds common law understandings of the doctrine. But this argument seems inconsistent with the *Lucas* Court’s suggestion that background principles may have the potential to evolve beyond their historical scope. The public trust doctrine is surely no exception to that acknowledgement. Therefore, in states that have adopted an expansive view of public rights, the public trust doctrine can be effectively used as a defense to takings claims in a variety of situations.⁵⁵

Of course, as Sax first advocated, and as Blumm and Ritchie suggest the Supreme Court has since endorsed,⁵⁶ there is no way to have the public trust doctrine reach resources such as the atmosphere or endangered species without expanding the scope of the doctrine. Prior to *Lucas*, Lazarus suggested this path was dangerous, and property scholars such as David Callies have reiterated the reasons why it remains so after *Lucas*.⁵⁷ However, our purpose in this Article is not to resolve their debate.

Rather, for those resources which fall squarely within the scope of the trust—navigable and tidally-influenced waters—the growing knowledge of the presence of natural capital on those resources and the public’s use of the ecosystem services flowing from it constitutes precisely the kind of new knowledge *Lucas* contemplates the common law will use to evolve. At least for those resources, this approach ought to satisfy both views of the appropriate scope of the trust. Sax’s view of the public trust doctrine as a source of ecological management law elevates the status of natural capital

⁵⁴ Blumm & Ritchie, *supra* note 53, at 342.

⁵⁵ *Id.* at 343-44.

⁵⁶ *Id.*

⁵⁷ See David L. Callies, *Custom and Public Trust: Background Principles of State Property Law*, 30 *Envtl. L. Rptr. (Envtl. L. Inst.)* 10,003 (2000) (expanding the public trust doctrine transforms its common law origins in violation of the *Lucas* principles); David L. Callies and J. David Breemer, *Selected Legal and Policy Trends in Takings Law: Background Principles, Custom and Public Trust “Exceptions” and the (Mis)use of Investment-Backed Expectations*, 36 *VAL. U. L. REV.* 339, 378-79 (2000).

and ecosystem services to that of protected uses. At the same time, however, concerns about preserving the integrity of the doctrine also are satisfied, because integrating this new knowledge to more fully define the doctrine's protected uses does not require an expansion of the doctrine outside its utilitarian common law traditions. Indeed, it is fully consistent with, if not compelled by, those traditions. As such, it is an easy matter for courts to accomplish.

For example, in *Avenal v. State*,⁵⁸ the Louisiana Supreme Court considered state land oyster bed lessees' claims that a state coastal diversion canal project constituted a taking. The purpose of the project, which required the lessees to relocate their oyster beds to other state lands, was to restore freshwater flow (and the sediment carried with it) from the Mississippi River to coastal areas in order to impede loss of coastal marshes. Because this would have lowered salinity in the waters overlying the oyster beds, the state established a program to allow operators to move their beds. However, many lessees objected and sought compensation through an inverse condemnation action.

A central issue in the case became the validity and enforceability of hold harmless clauses contained within most of the leases that specifically referenced coastal restoration, which the state argued was designed to support application of the public trust doctrine. Under Louisiana law, the public trust doctrine is implemented as a "balancing process in which environmental costs and benefits must be given full and careful consideration along with economic, social and other factors."⁵⁹ The court found that the diversion project fits precisely within the public trust doctrine. The public resource at issue is our very coastline, the loss of which is occurring at an alarming rate. The risks involved are not just environmental, but involve the health, safety, and welfare of our people, as coastal erosion removes *an important barrier between large populations and ever-threatening hurricanes and storms*.⁶⁰

IV. CONCLUSION

We recognize that ecosystem service values will not always carry the day. Some trust lands may provide little in the way of economically valuable

⁵⁸ *Avenal v. State*, 2003-3521 (La. 10/19/04), 886 So.2d 1085.

⁵⁹ *Id.* at 1101 (citing *Jurisich v. Jenkins*, 99-0076 (La.10/19/99), 749 So.2d 597, 604-5).

⁶⁰ *Id.* (emphasis added). Although Blumm and Ritchie discuss *Avenal*, they do so in connection with the "destruction by necessity" defense to takings claims, not in connection with the court's discussion of the public trust doctrine. See Blumm & Ritchie, *supra* note 53, at 41-42.

ecosystem services. Conversely, in some cases, other protected trust land uses, such as navigation and fishing, may prove far more valuable. As a general matter, under this Article's proposal, natural capital and ecosystem services would stand on equal footing with other economically valuable doctrine-protected uses. Indeed, when those other uses are not present, ecosystem service values may provide the state its exclusive means to defend its protection of the trust resources and may afford citizens their sole means of challenging the state when it fails to do so.

Therefore, this Article proposes reshaping the way ecological goals are framed to fit the public trust doctrine, rather than reshaping the public trust doctrine to fit ecological goals. As such, our approach presents no revolutionary twist of the public trust doctrine. On the contrary, doing so simply reflects new knowledge of the economic importance of natural capital and ecosystem services.

To be sure, this approach neither carries the public trust doctrine as far as Sax envisioned nor puts the doctrine where Lazarus suggested it belongs. Yet, if judges expand the doctrine to reach non-traditional resources, then the value of natural capital and ecosystem services ought to follow as protected uses. Furthermore, if the doctrine eventually plays any role at all in environmental law, although its involvement would pale in comparison to the weight of statutory regimes, recognizing the value of natural capital and ecosystem services does not offend the doctrine's traditional sensibilities. Therefore, neither the "modern" public trust doctrine nor the "traditional" public trust doctrine should have the slightest objection to integrating natural capital and ecosystem service values.

One practical effect of the Article's proposal warrants emphasis. Unlike other common law doctrines that receive some play in environmental law, the public trust doctrine can serve as both a shield and a thorn for governments. After *Lucas*, governments more readily point to the public trust doctrine as a background principle of property law that shields public regulation from regulatory taking challenges. Appeals to the value of natural capital and ecosystem services strengthen that strategy, as the *Avenal* case illustrates. Yet, as natural capital and ecosystem service values become a part of the doctrine, they will strengthen the doctrine's effect as a thorn in the government's plans to approve development or alienation of trust resources. The fact that breach of trust cases have not been a significant force in the doctrine's application may be due to the nature of traditional protected uses, such as navigation, recreation, and commerce. If natural capital and ecosystem service values are recognized as protected trust uses, breach of trust cases may turn on a very different calculus than in the past.

In the long run, therefore, while this Article's proposal fits natural capital and ecosystem services within the doctrine's traditional framework, the effect could be quite untraditional. So goes the evolution of the common law.